

BOOK REVIEWS

PALYNOLOGISCHE UNTERSUCHUNGEN AN CAPRIFOLIACEAE: 1. SAMBUCEAE, VIBRURNEAE UND DIERVILLEAE, by Evelyn Böhnke-Gütlein and Focko Weberling, with pp. 63. Wiesbaden: Franz Steiner Verlag GmbH. (Tropische und subtropische Pflanzenwelt 34, 1981). DM 24,40.

In recent years the study of pollen morphology has become an important tool in plant taxonomy. The fine structure and sculpture of the sporoderm can give very valuable information on the systematic relationships of plant taxa. The study of Böhnke-Gütlein and Weberling on the Caprifoliaceae is a very good example of this modern approach to plant taxonomy.

In this technical publication of 63 pages the authors give an account of their studies of the pollen morphology of the Sambuceae, Viburneae and Diervilleae. The pollen characteristics of 49 species of these tribes are uniformly and systematically described using the terminology of Straka. Only herbarium material was used for these studies. The pollen samples were boiled in 10 % KOH and thereafter treated with the acetolysis method of Erdtman.

Light- and scanning electronmicroscopy were used for the pollen morphological studies of the exine, the latter including 0.15 μ sections cut with a freezing microtome. The SEM material was coated with Gold and Palladium applying the Critical-Point-Drying technique. The descriptions of the various pollen types are illustrated with SEM micrographs of extremely good quality. It is a pity, however, that light-micrographs are not included and also that no transmission electronmicroscope studies were carried out at this level of pollen taxonomic studies.

The pollen of the highly developed Caprifoliaceae belongs to the trizonocolporate, tetrazonocolporate and trizonopororate types. The exine structures are very clearly described with the aid of an excellent scheme showing the transitions between tectate and intectate forms. According to Walker and Doyle, on the basis of their studies of the Ranales, the main evolutionary trend in the exine of angiosperms seems to proceed from tectate-imperforate to tectate-perforate and semitectate pollen to intectate types. In some angiosperms, however, the reverse development occurs. This is borne out by the study of Böhnke-Gütlein and Weberling of the highly developed Caprifoliaceae.

This softcover publication is very well produced. The text is lucid and well written and an English summary is provided. The bibliography includes references to foremost palynologists in this field, although little reference is made to the classical works of Erdtman and Faegri and Iversen.

The publication with its excellent illustrations will be of great use to those engaged in studies of recent or fossil pollen in systematic or pollen analytical investigations.

J. A. COETZEE

MOLECULAR BIOLOGY OF THE CELL, by B. Alberts, D. Bray, J. Lewis, M. Raaf, K. Roberts and J. D. Watson, with pp. xxxix + 1145. New York, London: Garland Publishing, 1983. US \$23,00. ISBN 0 8240 7283 9.

It is not every book that can boast a table of contents consisting of 20 pages. But then, *Molecular Biology of the Cell* is not just any book. It is a compendium first and foremost of the cytology and molecular biology of eucaryotic cells and, last but not least, of their behaviour in multicellular communities of tissues, organs and organisms. The book deals mainly with the animal cell, although one chapter and parts of others are set aside for plant cells and their specific processes.

Briefly, the book comprises three sections. The first considers the evolution of the cell; its micromolecules and biosynthetic activities; the structure, shape and information-yielding qualities of its macromolecules; and the techniques used in studying it. The second deals with the cell's molecular organisation; with its nucleus, organelles and membranous systems, its cytoskeleton, energy conversions, growth and division; and with intercellular communication. The third section is devoted to cells in and as tissues and multicellular organisms; the maintenance of tissues; immune and nervous systems; and, as indicated above, to special features of plant cells.

Although a softcover book, the quality of reproduction of the photographs is good and the explanatory figures are excellently drawn. Clearly, this book is intended for the student in biology and medicine who already has completed a course in introductory biology, but I am convinced that also postgraduates, lecturers and professional scientists will find it a guide of almost encyclopedic proportion. Coverage is broad but detailed, with adequate general and cited references as well as a useful 33-page index.

As compared with most other scientific books today, *Molecular Biology of the Cell* at US \$23,00 is not only ridiculously inexpensive, but an essential acquisition for the biologist's personal library.

CHRIS H. BORNMAN

THE CHANGING CLIMATE: RESPONSES OF THE NATURAL FLORA AND FAUNA, by Michael J. Ford, with pp. 192 + 50 figures. London: George Allen and Unwin, 1982. £13,95, approx. US\$ 27,50. ISBN 004 574017 8.

As mentioned by the author, this book is a first attempt to present a comprehensive account of the ways in which plants and animals of natural habitats react to changing climates. In this connection the considerable past climatic changes, their effects and possible causes are briefly discussed. Special attention is focused on the various types of evidence from important disciplines such as palynology, deep sea sediments and oxygen isotope ratios. Historical records such as those from dendrochronological studies are referred to. For an understanding of these past events the mechanisms for climatic change and present climatic systems are discussed at length.

The author has succeeded in presenting in eleven subdivided chapters a concise synthesis of many aspects of this vast subject in such an interesting way that it should inspire further research in many related fields. A wide range of examples, especially from historical times, is used to clearly indicate the interactions between changing climate and organisms and their habitat. The levels of response of individuals,

species and whole ecosystems are discussed and it is emphasised that temperature is the basic factor affecting and driving climatic systems and hence life processes. With regard to the latter, metabolic processes which are temperature dependent, determine tolerance limits of species. In this regard, stenotopic organisms are extremely vulnerable to climatic change. These aspects are, for instance, very important in marginal climatic habitats such as at the tree line on high altitudinal mountains or in high northern latitudes. The length of the growing season in these areas is very important for survival and in this regard the ranges of expansion and contraction of biomes with respective amelioration or deterioration of climate are discussed. In this connection it is emphasised that where habitats in such areas shrink as a result of anthropogenic activities, final extinction of species may result.

Many facets of the close interaction between climate and organisms are elaborated on, such as parasite-pathogen-host relationships, long distance dispersal of propagules and colonisation, bird migration, phenology and competition in communities. With regard to the latter, the considerations are relevant to the present heated controversies among ecologists about the theories of competition.

For this survey of basic information, reference has been made to numerous articles by leading scientists from many different relevant disciplines. Important attention has been drawn to many aspects of relationships between climate and biota which should be considered when dealing with present and past ecosystems. For this reason this book is recommended as a valuable reference for ecologists, palaeoecologists, palynologists, biogeographers, conservationists and climatologists.

J. A. COETZEE

DAS HORMONSYSTEM DER PFLANZEN, by K. Dörffling, with pp. xviii + 236. Stuttgart, New York: Thieme, 1982. DM 29.80. ISBN 3 13 618501 3.

George Thieme Verlag of Stuttgart in the German Federal Republic publishes a softcover series designated BIO. This series, "Die blaue Bücher" has become a characteristic and popular feature of the university bookstore and a few of the most successful titles published in the handy 120 × 190 mm format include: *Allgemeine Botanik* (Nultsch), *Allgemeine Mikrobiologie* (Schlegel), *Genetik* (Kalmus) and *Das Wesen der Biochemie* (Baldwin). Now there has appeared *Das Hormonsystem der Pflanzen* by hormone physiologist Karl Dörffling of the University of Hamburg, author of many outstanding papers not least of which are the regular review contributions to *Progress in Botany*.

Although there are many excellent textbooks of general botany and plant physiology in the German language, the last monograph on plant hormones was published 30 years ago. In this respect the book under review was overdue in Germany. However, from the point of view of understanding the complexity of hormonal action and interaction, a treatment bold enough to break with the traditional linking of a specific physiological process with only one specific hormone, was very long overdue. The various hypotheses regarding the physiological function of the hormones are given critical consideration.

The book contains 18 chapters, of which five on the auxins, gibberellins, cytokinins, abscisic acid and ethylene make up slightly more than half the volume. Each hormone group is considered in terms of its discovery, structure and mode of action. In addition there is information on isolation, characterisation and special effects. There are chapters dealing with flowering, sexual hormones, interaction, dormancy,

and senescence and abscission. One chapter treats applied aspects and growth regulation, and naturally also includes reference to growth regulators other than hormones.

The author has made liberal use of illustrations and has included results in the form of graphs, histograms and line drawings from some of the best published papers. In addition to a list of cited references, each chapter is concluded with suggested further readings of monographs, review articles and chapters from treatises. Although based on lectures to students in botany, this little book is recommended reading for anyone seriously interested in plant growth substances. In fact, when read in conjunction with the controversial and unconventional views of A. J. Trewavas (for example: How do plant growth substances work?—*Plant, Cell and Environment* 4: 203–228, 1981, and, Growth substance sensitivity: the limiting factor in plant development—*Physiol. Plant.* 55: 60–72, 1982), Dörffling's treatment of hormones in plants brings a refreshing perspective to an aspect of plant physiology in which, in the past, compartmentalised thinking probably has been responsible for the concept that hormones act in compartmentalised fashion.

CHRIS H. BORNMAN